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an account of a chlorophane from Virginia and one from Siberia, which passes from light green to a fine emerald green as the temperature rises, but no mention is made of a change of hue, although the mineral was placed on a live coal. I was sufficiently interested to investigate further. If the fragment be cooled when emitting either the green or the purple light and be heated again, the light which it was giving when cooled will return. Thus, if giving purple light and then cooled and again heated, it does not now first give the green, but emits the purple as soon as it reaches the temperature at which it became non-luminous. It was found also that the several specimens became luminous at temperatures ranging from 100°–110° C., and that the purple violet tint appeared at 170°–180° C. It was impossible with the Hg. thermometer to measure the temperature at which the fluorite lost the power of phosphorescence, but it was below a red heat in the form of the experiment tried by me. It is by no means a matter of indifference whether the temperature rises slowly or rapidly in exciting phosphorescence. A piece of the mineral was broken into two nearly equally portions. One of these was heated rapidly, the other slowly. That rapidly heated emitted a fine green which was succeeded by a distinct and moderately deep purple. The slow heating was accomplished by placing the mineral on the edge of a metal plate heated in the center by a gas flame. It became faint green as soon as it became warm. Presently the light entirely disappeared; on moving the mineral to a warmer part of the plate, the green phosphorescence again appeared, to disappear and reappear as before. At length it lost the power of phosphorescing by increasing the temperature. In other words, its power to emit light was gone. In this case of slow heating only the faintest approach to a violet tint was perceptible. I have no doubt that by careful manipulation it might have been made to yield pure green light only; and indeed, I believe that if the temperature be very slowly raised these specimens of fluorite would ultimately lose the power of giving out phosphorescent light at any temperature without at any time becoming luminous. Experiments upon this point have not been entirely conclusive, but have indicated this result. If it be true that by slow heating, specimens which more rapidly heated give both green and purple light, yield only green light, and that if very slowly heated no phosphorescent light will be given out however high the temperature be raised, then the molecular change, whatever it be, that causes phosphorescence, and which when effected precludes the recurrence of the phenomenon, may be produced so slowly as to emit no light whatever.

The specimens of fluorite from Colorado, like those from the localities previously mentioned, became phosphorescent by friction, best against each other, but also against other minerals and metals. The friction need not be very great to elicit light. This result is well shown by holding a piece of the mineral on a grindstone. The abraded powder remains luminous for a time, making a streak of light as the stone revolves. Other specimens of fluorite in our cabinet do not show this change of color, and do not become phosphorescent by attrition.

CHRISTENING AMETHYST MOUNTAIN.

BY J. SAVAGE.

Amethyst Mountain is situated upon the East fork of the Yellowstone, in the National Park, and was so named by Prof. F. V. Hayden during the summer of 1872, under the following circumstances:

The main party of Hayden's Geological Survey were camped in Cache valley, near the mouth of the East fork of the Yellowstone, while Prof. Hayden, Sir Wm. Blackmore, our English guest, and a few others, made a hurried trip to the headwaters of Clark's fork and Shields's river. This trip took them up the valley of the East fork to its source, and occupied some three or four days.

During their absence, the remainder of the party were employed in exploring the vicinity of our camp. In company with Dr. Platt, of Waterbury, Conn., I went up the East fork some six or eight miles, and, as was our usual custom, climbed a rather high mountain, south of the river a couple of miles, perhaps. Here we found the summit covered with petrified trees, many of which were lying prostrate — some thirty or forty feet long — upon the surface of the ground. Upon another portion of the summit were many other petrified trees still standing upright where they grew; some were of large size, and afterwards were found by actual measurement to be ten feet in diameter. Many of these fossil trees had been covered with volcanic material, and were seen standing out from perpendicular cliffs, where the volcanic material was weathering away. We hitched our saddle horses to upright stumps of these trees and ate our dinner, and returned to camp laden with the product of this weird mountain-top.

The next day, August 1st, in company with Prof. Wakefield, of Hiram College, I returned to this same peak, and continued my explorations. It was during this day's search that I turned over a large section of a petrified tree which had been hollow, but was now filled with beautiful crystals of amethyst. It was a beautiful sight, and one long to be remembered! We filled our saddlebags and pouches with these crystals, and started off for camp. It was a Mr. Sloane — a graduate of Columbia College — who first met us, and seizing a good-sized specimen, went shouting through camp, "Amethyst! Amethyst!" The entire camp gathered around us in admiration of the crystals, and each one secured a goodly number of crystals for himself.

The next day, Dr. A. C. Peale, our mineralogist, and several others of the party, returned with us to the peak, and found other parts of the same tree, and still other specimens of amethyst from other trees; and from this time forth, *Amethyst* Mountain occupies its place upon all our late maps. It may be interesting to add, that the crystals which were exposed above the ground to the sunlight had entirely lost their violet color, and were simply quartz crystals, while those below the surface, upon the same slab, had retained their color perfectly.

THE LAST SUBMERSION AND EMERGENCE OF SOUTHEASTERN KANSAS FROM THE CARBONIFEROUS SEAS, OR THOSE AFFECTING THE CARBONIFEROUS FORMATION IN KANSAS.

BY E. P. WEST.

The country along the line of the Southern Kansas Railway all through southeastern Kansas and extending westward to Harper, the present terminus of the road, is unsurpassed in beauty and the fertility of its broad fields and valleys. It is said, and truthfully, to be the paradise of the husbandman and the pasturist; and it is no less so of the geologist, the poet, and the artist. Whoever has traveled over the line of this road could not have failed to observe the picturesque and poetic beauty everywhere meeting the eye. Symmetrical mounds rise from the broad plains and valleys, as if by the work of magic, and terraced cliffs, terrace rising above terrace in solemn grandeur, environ the road. Sometimes the cliffs are circular, forming vast amphitheaters, extending back for miles. Those mark the last emergence of southeastern Kansas from the carboniferous seas, and bear unmistakable evidence of powerful and persistent forces which, though perhaps comparatively brief, have left their impress boldly written on every feature of the country. Water-worn pebbles, commonly known as gravel beds, are found in the channels of streams, in the valleys, under the soil, and over the highest mounds and ridges all over